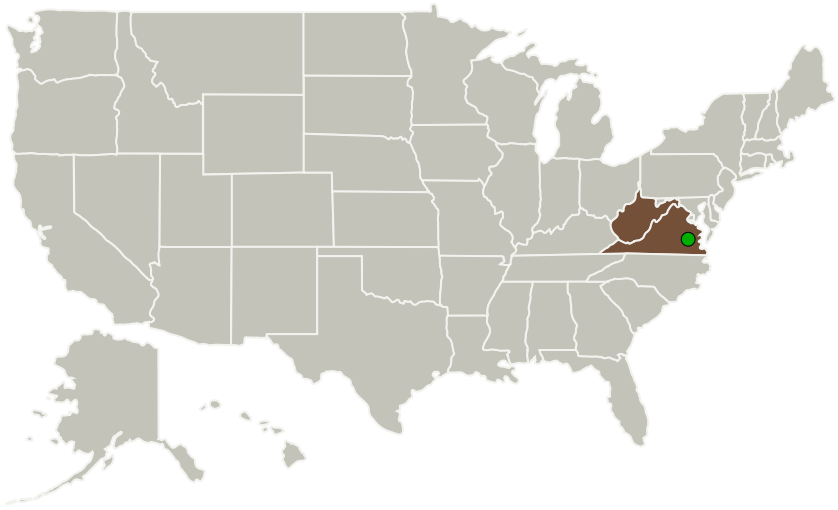
Aluminum-Lithium Alloy 2050 for Reduced-Weight, Increased-Stiffness Space Structures, Phase I

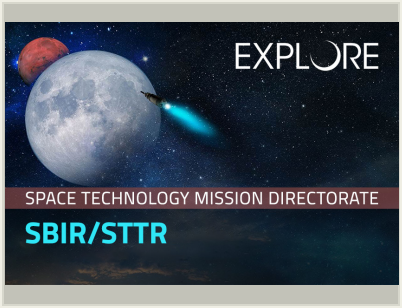
Completed Technology Project (2011 - 2011)

Project Introduction

Touchstone Research Laboratory, along with Alcan Rolled Products Ravenswood WV, has identified the Aluminum-Lithium Alloy 2050 as a potentially game-changing material replacement for current space structural alloys such as Aluminum-Lithium alloy 2195. AA2050 is available in significantly thicker plate gauges than AA2195 and, as a result, can be machined or formed into ribs, stringers or other types of stiffened structures that have increased stiffness and as a result provide overall structural weight savings potential of approximately 15 to 20%. The AA2050, however, needs more development work and understanding in the area of cryogenic material properties, joining, and design potential to be considered for NASA mission vehicles. Touchstone is proposing a Phase I effort to do cryogenic characterization testing, concept design, and computational modeling and analysis to demonstrate the feasibility of using AA2050 for increased-stiffness, reduced-weight space structures.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Touchstone Research Laboratory, Ltd.	Lead Organization	Industry	Triadelphia, West Virginia
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

Primary U.S. Work Locations	
Virginia	West Virginia

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/137994)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Touchstone Research Laboratory, Ltd.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

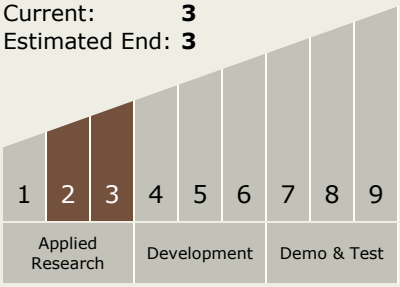
Carlos Torrez

Principal Investigator:

Jesse Blacker

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.1 Materials
    - TX12.1.7 Special Materials

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System